

THE ENDEMIC PINYON OF LOWER CALIFORNIA . *PINUS LAGUNAE* M.-F. PASSINI

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Mexico has been an important center of *Pinus* diversification, in particular of pines belonging to the sub-section *cebrooides* which counts, now, 12 species. My study of ecology and distribution of pines from the *cebrooides* group (Passini, 1981) led me to describe, the pine in Sierra de la Laguna, Lower California as a variety of *Pinus cebrooides* Zucc. (Robert-Passini 1981). In 1983, Bailey decided to give it subspecific rank. The morphological observations made by Pinel (1985) and the results obtained by Zavarin and Snajberk (pers. comm.) justify raising the rank to species.

PINUS LAGUNAE (M.-F. Robert-Passini, D.K. Bailey) M.F. Passini, *comb. nov.*
Pinus cebrooides subsp. *lagunae* (Robert-Passini) D.K. Bailey, *Phytologia* 54, 2, 89-99, 1983
Pinus cebrooides var. *lagunae* M.-F. Robert-Passini, *Adansonia*, ser. 4, 3, sec. B, n° 1, 64-66, 1981
HOLOTYPE : -P, Sierra La Laguna, Delegación Todos Santos, Baja California Sur, 23°34' N, 109°55' W, crystalline rock, 1650 m., 15.02.1978, M.-F. Robert 10021 (HOLO- : P; ISO- : MPU, TLJ, ENCB, INIF)

We have some several additional characters to complete the description of the variety, using samples collected in february 1978 and july 1985. *Pinus lagunae* has an upright trunk, generally 12-15 meters high but can grow up to 21 meters. In open surroundings the habit is pyramid shaped whereas in a closed environment the crown is sparse. The bark of mature trees is fissured and exhibits thick regular plates. The grey branchlets bear 3 needle fascicles (sometimes 2, seldom 4), 4-9 cm long (average length is 6.9 cm) soft to the touch and grey green in colour). Dorsal and ventral surfaces have stomatal lines with more on the ventral surface, 4-8 lines, than on the dorsal surface, 1-3 lines. The sub-globular cones are pedunculate, their average length is 3.9 cm and they grow singly or in twos. The peduncle can be 0,2 to 1,2 mm long and comes away with the cone. The apterous seeds are 10 to 16 mm long, 6 to 10 mm wide with a 0,2 to 0,9 mm thick shell. The endosperm is pink coloured.

The following morphological characters distinguish *Pinus lagunae* from *Pinus cebrooides* s.l. : longer, more slender needles, longer cone peduncle, higher number of cotyledons (12,62), doubly quick-growing plantlets and saplings. But the biochemical characteristics revealed by Zavarin and Snajberk (1985) also bear this difference. *Pinus cebrooides* wood is high in α -pinene : 87,5% (min. 64,6 max. 96,7 %), low in sabinene : 3,4% (0,5-10,2 %) and in terpinolene : 2,1% (0,7-10,2 %). On the contrary *Pinus lagunae* is low in α -pinene : 13,5% (min 10,6 max. 16,1%), high in sabinene : 31,7% (14,5-45,7%) and in terpinolene : 27,2% (19,6-42,1%).

The monoterpene biosynthesis chains of these two taxa are quite distinct. The difference between *Pinus lagunae* and *Pinus cembroides* is greater than that between *Pinus remota* and *Pinus cembroides* (Snajberk and Zavarin, 1986). The monoterpene constituents of *Pinus lagunae* are more akin to those of *Pinus discolor* than to *Pinus cembroides*. Like *Pinus lagunae*, *Pinus discolor* synthesizes sabinene and terpinolene as well as a fair amount of β -cymene (12.4% average). The latter only present in very small quantities in *Pinus lagunae* wood (1.7%).

In addition to these characteristics pointed out by Passini, Bailey, Zavarin and Snajberk, the existence, in Sierra de la Laguna, of two varieties (Pinel, 1985) - one with a thin shell, 0.25-0.5 mm, the other with a thick shell (0.6-1 mm), has led me to raise *Pinus cembroides* subsp. *lagunae* (M.-F. Robert-Passini) D.K. Bailey to specific status.

Differentiating a taxon distinct from *Pinus cembroides* in Sierra de la Laguna was facilitated by the long term isolation which the mountains in the far southern tip of the Lower California peninsula underwent throughout the Tertiary period. This geographical isolation was accentuated in the Miocen by the La Paz-Todos Santos north-south fault.

This endemic species of Lower California, which adapts to chalkly parent rock soils, offers many advantages for reforestation of dry, eroded areas, since growth rate is rapid (Passini, 1981). On these grounds, genetic studies will have to be pursued.

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